

IN THE CLAIMS:

Kindly cancel independent claim 13 without prejudice or admission, amend claims 1-12 and 14-22, and add new claims 23-30 as shown in the following listing of claims, which replaces all prior versions and listings of claims in the captioned application.

1. (currently amended) An optical waveguide probe comprising:

a support member;

a thin film optical waveguide deposited on the support member and having an elongated portion over the support member and a cantilever -like shape portion extending beyond the support member;

a probe provided at a tip of the cantilever portion of the optical waveguide and comprising a sharp tip extending sharpened in a substantially vertical direction with respect to the optical waveguide, and the probe having a minute aperture at the sharp a tip of the probe; and

a bent portion joining the cantilever portion of where a vicinity of the tip of the optical waveguide and is bent toward a side of the probe, wherein the bent portion having has a deflecting function for deflecting a propagated light in the optical waveguide.

2. (currently amended) An optical waveguide probe according to claim 1; ~~claim 1~~, wherein a deflection angle of the propagated light at the bent portion is 90 degrees or less.

3. (currently amended) An optical waveguide probe according to claim 1; ~~claim 1~~, wherein the propagated light is deflected by a single surface of the bent portion ~~deflects the propagated light by a single surface~~.

4. (currently amended) An optical waveguide probe according to claim 3; ~~claim 3~~, wherein the single surface is a surface orthogonal to an optical axis plane extending ~~including an optical axis~~ from the optical waveguide to the minute aperture.

5. (currently amended) An optical waveguide probe according to claim 3; ~~claim 3~~, wherein the single surface is a surface which is not orthogonal to an optical axis plane extending from the optical waveguide to the minute aperture.

6. (currently amended) An optical waveguide probe according to claim 5; ~~claim 5~~, wherein an angle of the single surface is disposed at an angle of 45 degrees or less with respect to a plane orthogonal to the optical axis plane and including an optical axis of the waveguide ~~is 45 degrees or less~~.

7. (currently amended) An optical waveguide probe according to claim 1; ~~elaim 1~~, wherein the bent portion has a plurality of bends defining is bent at a plurality of surfaces substantially symmetrical with respect to an optical axis plane extending from including an optical axis from the optical waveguide to the minute aperture.

8. (currently amended) An optical waveguide probe according to claim 7; ~~elaim 7~~, wherein the plurality of surfaces are ~~a plurality of~~ flat surfaces.

9. (currently amended) An optical waveguide probe according to claim 8; ~~elaim 8~~, wherein the plurality of flat surfaces are respectively not vertical relative to the optical axis plane.

10. (currently amended) An optical waveguide probe according to claim 1; further comprising a reflective film formed on ~~elaim 1~~, wherein the bent portion ~~includes a reflecting film~~.

11. (currently amended) An optical waveguide probe according to claim 1; ~~elaim 1~~, further comprising a positioning guide provided at the support member ~~a support portion of the optical waveguide~~, for positioning an optical element relative to the optical waveguide.

12. (currently amended) An optical waveguide probe according to claim 11; ~~claim 11~~, wherein the guide is a V-shaped groove formed in the support member.

13. (canceled)

14. (currently amended) A manufacturing method of a near-field ~~an~~ optical waveguide probe ~~used for a scanning near-field optical microscope~~, comprising:

a substrate formation step of forming a substrate having a curved upper surface portion on which a thin film ~~an~~ optical waveguide is to be deposited;

a deposition step of depositing and patterning a thin film on the substrate to form the thin film optical waveguide on the substrate so that the optical waveguide has a bent portion formed on the curved upper surface portion of the substrate; and

a separation step of separating a part of the optical waveguide from the substrate so that a portion of the optical waveguide extends beyond the substrate ~~substrate,~~

~~wherein the substrate formation step, the bent-shaped substrate for bending the part of the optical waveguide is formed.~~

15. (currently amended) A manufacturing method of a near-field ~~an~~ optical waveguide probe according to claim 14; ~~claim 14~~, wherein the substrate formation step comprises the

~~is a~~ step of forming the substrate to have including a lower surface parallel to an optical axis of the optical waveguide, and a plurality of surfaces which are not vertical to the lower surface and are substantially symmetrical with respect to a plane including the optical axis and a normal of the lower surface.

16. (currently amended) A manufacturing method of a near-field ~~an~~ optical waveguide probe according to claim 14; ~~claim 14,~~ wherein the substrate formation step comprises the ~~is a~~ step of forming the curved upper surface portion of the substrate by ~~using an~~ anisotropic etching.

17. (currently amended) A manufacturing method of a near-field ~~an~~ optical waveguide probe ~~used for a scanning near-field optical microscope,~~ in which two substrates are bonded to each other through a material having a different etching characteristic ~~is used,~~ the method comprising:

a step of forming a curved step portion for bending a part of an optical waveguide on a first one of the substrates so that a thin film optical waveguide deposited on the first substrate has a bent portion formed on the curved step portion; and

a step of forming a positioning guide for an optical element on a second ~~the other~~ of the substrates.

18. (currently amended) A manufacturing method of a near-field an optical waveguide probe according to claim 17; ~~claim 17~~, wherein the first substrate is a single crystal silicon substrate.

19. (currently amended) A manufacturing method of a near-field an optical waveguide probe according to claim 17; ~~claim 17~~, wherein the two substrates are single crystal silicon substrates having identical plane orientations.

20. (currently amended) A manufacturing method of a near-field an optical waveguide probe according to claim 17; ~~claim 17~~, wherein the two substrates are single crystal silicon substrates having different plane orientations.

21. (currently amended) A manufacturing method of a near-field an optical waveguide probe according to claim 17; ~~claim 17~~, wherein the substrates are bonded so that an optical axis direction of the optical waveguide formed on ~~of~~ the first substrate ~~forming a mold~~ is coincident with an optical axis direction of the positioning guide formed on ~~of~~ the substrate ~~forming the guide~~.

22. (currently amended) A manufacturing method of an optical waveguide probe according to claim 17; further comprising the steps of forming ~~claim 17~~, wherein a core of

the optical waveguide on the first substrate by depositing a thin film; and forming a pattern for defining the positioning guide for the optical element are simultaneously with the step of forming a core of the optical waveguide formed.

23. (new) An optical waveguide probe comprising: a support member; and a thin film optical waveguide formed partly on the support member and having a waveguide portion disposed over the support member and a probe portion extending beyond the support member at a given angle relative to the waveguide portion to form a cantilever.

24. (new) An optical waveguide probe according to claim 23; wherein the thin film optical waveguide has a bent portion disposed between the waveguide portion and the probe portion for deflecting light propagating through the thin film optical waveguide.

25. (new) An optical waveguide probe according to claim 24; wherein the bent portion deflects the propagated light by 90 degrees or less.

26. (new) An optical waveguide probe according to claim 24; wherein the bent portion has a plurality of bends defining a plurality of surfaces substantially symmetrical with respect to an optical axis plane extending from the optical waveguide portion to a tip of the probe portion.

27. (new) An optical waveguide probe according to claim 26; wherein the plurality of surfaces are each flat surfaces.

28. (new) An optical waveguide probe according to claim 23; wherein the propagated light is deflected by a single surface of the bent portion.

29. (new) An optical waveguide probe according to claim 23: wherein the single surface is orthogonal to an optical axis of the optical waveguide extending from the waveguide portion to a tip of the probe portion.

30. (new) An optical waveguide probe according to claim 23; further comprising a light reflecting film formed over the waveguide portion and the probe portion except for a minute aperture at a tip of the probe portion.